May 2024

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Halle Strege  
*Ohio University*

Kaitlyn Burnham  
*Ohio University*

Laura L. Harris  
*Ohio University, harrisl2@ohio.edu*

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**Recommended Citation**

DOI: [https://doi.org/10.25035/jsmahs.10.01.07](https://doi.org/10.25035/jsmahs.10.01.07)  
Available at: [https://scholarworks.bgsu.edu/jsmahs/vol10/iss1/7](https://scholarworks.bgsu.edu/jsmahs/vol10/iss1/7)
Quality Improvement of a Post-Concussion Recovery Protocol

Halle Strege; Kaitlyn Burnham; Laura L. Harris PhD, AT
Ohio University, Dublin, OH

OBJECTIVE
To determine the effectiveness of a post-concussion recovery protocol in an adolescent athletic population.

STUDY DESIGN AND DESIGN
A retrospective study to compare the number of days until unrestricted activity across two post-concussion recovery groups from two different Ohio school districts.

PARTICIPANTS
The electronic medical records of athletes diagnosed with a sport-related concussion (SRC) during 2024 were matched with those who were diagnosed with a SRC in 2023. Participants were matched based upon sex, age, and the initial SCAT number of symptoms (0-22) and symptom severity score (0-132). Participants (n=12; 6 females) ranged in ages 13-16 years. To be included participants must have been diagnosed with a SRC by an athletic trainer, who performed the initial evaluation within 72 hours of impact. Participants 18 years or older with a previous history of two or more concussions, a neurological disorder, brain surgery, treatment for substance abuse, and/or psychiatric disorder were excluded.

INTERVENTION
Within the experimental group, each participant completed daily subthreshold aerobic exercise (maximal heart rate <80%) for 15 minutes beginning when each reported SCAT symptom severity was 4 or less. Additional exercises were implemented depending upon the symptoms experienced by the participant (e.g., ocular, vestibular, cognitive). Those with ocular symptoms completed exercises to improve convergence. Those with vestibular symptoms completed balance exercises. Those with cognitive symptoms completed dual-task training. Matched controls followed the standard five-stage concussion protocol and did not perform daily subthreshold aerobic exercise, dual task exercises, or symptom specific rehabilitation exercises.

MAIN OUTCOME MEASUREMENT
Total days of recovery, calculated as the number of days from injury to the unrestricted return to activity, was compared between the groups using an independent-sample t-test. Alpha level was set at 0.05.

RESULTS
When comparing age (14.40 ± 1.17; p = 0.65) and summated symptom score (21.08 ± 17.20, p = 0.72), there were no significant differences reported between groups. There was no significant difference (p = 0.62) reported for total days of recovery between groups (control = 14.33 ± 3.61; experimental = 15.83 ± 7.49; g=0.25).

CONCLUSION
In 2017 The National Federation of State High School Associations (NFHS) recommended a gradual return-to-play concussion protocol that is still used today.1 This protocol requires physical and cognitive rest followed by a graded return to routine sport activity. While most adolescent patients will recovery within 10-14 days using this traditional protocol, it is estimated that 10-30% will develop post-concussive symptoms.2 For these patients, evidence supports the use of limited aerobic exercise and symptom-targeted rehabilitation.2-4 The results of this study fail to support the addition of limited aerobic exercise and symptom-targeted rehabilitation to reduce the recovery time from concussion.

KEY WORDS: Adolescents, Concussion, Vestibular, Ocular, Cognitive
REFERENCES


